



## Dairy Free Diets: An Ayurvedic Review

by Nadia Marshall

I'm just old enough to remember the good old days when the milkman delivered fresh unhomogenised milk straight to your door every few days. How good was it as a kid peeling off those foil lids and gorging on the creamy tops and the precious liquid that lay beneath?!

I LOVE milk. Always have, always will but my lordy has it changed in the last 30 years! The milk we get these days doesn't even remotely resemble the superfood it once was. It is no wonder so many people are giving it up. Lets explore this dairy-free phenomenon in a little more detail, from both a Western and Ayurvedic perspective...

### Why are people giving up dairy?

We come into contact with a lot of people who are dairy-free. I'm not sure if our exposure to such folk is representative of the population or if people with dairy intolerances just end up at our door. Whatever the reasons, we meet a lot of people who live their lives without dairy.... which is somewhat ironic given Ayurveda's absolute adoration of the stuff!

When I was a girl, people seemed to mainly give up dairy for ethical reasons – because they were choosing to be vegan and did not want to condone the practices of the dairy industry. But these days, in our experience, many more people are dairy-free for health reasons. They may have been told to give it up due to suspected lactose intolerance or they may just find it difficult to digest and feel better when they're off it. Some parents are even being advised to stop feeding their kids dairy in the case of recurrent ear infections and asthma.

Whatever the reason, the elimination of dairy foods feels like it's on the rise (although I couldn't find any figures to

support that)... but why? Why after thousands of years of eating dairy foods are so many modern humans having a problem with it?

### What is lactose?

Lactose is the sugar found in milk and other dairy products including butter, yoghurt, cheeses, cream, icecream and sour cream. It is a disaccharide made up of two monosaccharides – glucose and galactose (1). The amount of lactose found in dairy products varies enormously depending on its fat content, how it has been produced and what has been added to it.

Lactose is soluble in water so is generally found in the water-based portion of dairy products, not the fat-based portion. As a result, low-fat dairy products generally contain more lactose than full-fat products due to their lower fat content and the addition of 'milk solids'. Butter contains very little lactose and clarified butter or ghee is lactose free. Traditionally produced yoghurt contains lactose but also lactase produced by bacterial cultures so is usually tolerable while commercial brands have much higher quantities of lactose.

Traditionally manufactured cheeses have low levels of lactose due to the fermentation and aging techniques involved but commercial produced cheeses generally lack these lactose-reducing processes (3).

Lactose isn't just found in dairy products. It is also used as a commercial additive in many non-dairy foods including processed meats, gravy powder, margarines, sliced breads, breakfast cereals, potato chips, protein supplements, sauces as well as medications and other processed foods. Whenever 'lactoserum, whey, milk solids or modified milk ingredients' are listed in the ingredients, the product contains lactose (3)!

### What is the difference between lactose-free and dairy-free Diets?

Strict lactose-free diets are different to dairy-free diets in that they involve giving up all of the foods and products mentioned above, not just dairy-based foods. If super-strict, they may also involve giving up products processed on the same manufacturing equipment as milk-containing products.

It should be noted that dairy allergies are very different to lactose intolerance. They involve an autoimmune response following exposure to proteins found in dairy and are actually quite rare in adults (they are more common in children under the age of three) (4).

### What exactly is lactose intolerance?

Lactose molecules are too large to pass through the gut wall. They need to be broken down into their component parts by an enzyme in order to be absorbed. This enzyme, called 'lactase', is secreted by cells in the small intestine, specifically the jejunum and duodenum (1).

Lactose intolerant individuals either don't produce any or don't produce sufficient levels of lactase in their digestive system. As a result, the lactose moves into the large intestine intact where it is digested by bacteria in the colon through a process of fermentation – which produces large amounts of gas (hydrogen, carbon dioxide and methane) resulting in a variety of other symptoms such as abdominal cramping, bloating, flatulence, pain and diarrhoea. These symptoms appear between 30 minutes to two hours after eating and generally increase or decrease depending on the amount of lactose consumed (3).

Lactose intolerance is often self-diagnosed through observation but it can also be clinically diagnosed through a hydrogen breath test, blood sugar test, stool acidity test, intestinal biopsy, stool sugar chromatography or genetic diagnostic (the most definitive diagnostic)(3).

### **Why can some people digest lactose while others can't?**

Human babies usually produce lactase to help them digest their mother's milk but typically stop making it between 3-5 years of age, post-weaning. However, a large percentage of the human population have developed 'lactase persistence', where they continue to produce the enzyme throughout their adult life (3). Who keeps producing it and who doesn't all depends on our ancestors. Basically, descendants of cattle herders are more likely to maintain their tolerance for lactose throughout their lives.

All humans have a gene responsible for the production of lactase and another gene responsible for switching this gene on and off. About 7,500 years ago a mutation occurred in Europe and the lactase gene was permanently switched on for the first time. This mutation also occurred in Africa, in at least three separate locations between 3,000 and 7,000 years ago (2). Due to the significant evolutionary advantage populations gained by consuming dairy foods, this little mutation stuck around and spread considerably - a case of positive natural selection!

The closer you are to where the mutations arose, the greater the percentage of people who are able to digest lactose. Some 99% of Dutch people, 95% of Swedes and British people, 88% of European Americans, 84% of Russians, 80% of Indians and 80% of African Tulsis are lactose tolerant. As you move further away from the sites of the mutations, the percentage drops to about 50% in Italian, Spanish, French and Arab populations, and to only a 5% percent in China and 2% in Thailand. In Australia, 96% of Europeans are lactose tolerant while only 15% of Australian Aborigines are tolerant (6). Interesting stuff!

But not all lactose intolerance is the same. There are actually three different types:

*Primary lactase deficiency* – this is the most common form. If you have this it is simply because you are not the descendant of cattle herders!

*Secondary, acquired, or transient lactase deficiency* – in this case, you may be a descendant of a cattle herder but your ability to secrete lactase has been hampered due to a small intestine injury – possibly caused by acute gastroenteritis, diarrhea, chemotherapy, intestinal parasites or other environmental causes.

*Congenital lactase deficiency* – this one is very rare. It is an autosomal recessive genetic disorder that prevents lactase expression altogether, from birth which means it prevents babies from digesting breast milk. Interestingly it is most common in Finland (3).

So technically if you breastfed without any problems, your relatives have a history of drinking milk, and you haven't suffered from any severe intestinal injury then you should be capable of digesting dairy products. But many people aren't. And many others become less tolerant as they get older. So it appears something else is going on...

### **Is modern milk more difficult to digest?**

We've noted that commercially produced yoghurts and cheeses contain more lactose than their traditionally produced counterparts but is this also true of milk? Is modern milk more difficult to digest? Yes. Taking out the fat, putting in permeate, homogenising and pasteurising milk all have an effect on its digestibility. Whether milk is organic or non-organic has an effect too. This subject is rife with controversy and really warrants an entire article unto itself but let's explore each issue briefly...

#### *Low-fat milk*

As mentioned, lactose is soluble in water so is found in the water-based rather than the fat-based portion of milk. For this reason, 'reduced-fat' or 'fat-free' milks generally

have more lactose than full cream or whole milk. Other low fat dairy products also contain more lactose! The Western world has been vigorously promoting a low fat diet for the last 30-40 years. As a result, our milk is higher in lactose than it used to be and therefore more difficult to digest.

#### *Permeate*

It was revealed just a few years ago that it had become common practice for food producers to add 'permeate' to milk. Milk permeate is a by-product of the cheese production process. Permeate has a watery consistency and consists of lactose, water, vitamins and minerals. Apparently it used to be poured down the drain. But in more recent years, has been added to milk instead. The food producers say they do it to help maintain the consistency of their milk throughout the year – from its nutritional balance to its texture. The dairy farmers say they do it to drive down the price – because permeate costs 15c a litre while milk costs 50c a litre (12). Whatever the reason, the addition of permeate increases the amount of lactose in our milk, making it more difficult to digest!

#### *Homogenisation*

Homogenisation is any process that makes two non-soluble liquids the same throughout, such as water and fat. In the case of cow milk, homogenisation involves forcing the milk under extreme pressure through tiny holes to break up the large fat particles into tiny molecular structures that no longer regroup to form a cream layer but rather, are suspended throughout the milk in a uniform way. Before homogenization, fat globules range in size from 1-10 microns (a micron = ~0.00004 inch). After, the size range is reduced to 0.2-2 microns (11). That's pretty tiny!

Some researchers believe that homogenisation can potentially increase milk's ability to cause allergic reactions due to restructuring of the fat globule membranes which tend to incorporate more casein and whey proteins post-homogenisation (10). Other known effects on milk quality include increased viscosity (the milk is thicker), whiter appearance,

lowered heat stability, increased sensitivity to light-triggered oxidation and less pronounced milk flavor (11).

If you Google milk homogenisation, you'll find a lot of write ups on some research carried out by Dr Kurt Oster in the 1960s-1980s on milk homogenisation, artherosclerosis and heart disease. His specific hypothesis has actually since been disproven... but that doesn't mean the homogenisation process is completely benign.

Aside from increasing shelf-life and saving us mere mortals the arduous task of shaking the milk bottle before we pour out our milk, there really is no point to homogenisation whatsoever!

#### *Pasteurisation*

There are debates raging in the U.S. about pasteurised milk vs raw milk. On the 'main stream' side you have the argument of safety, bacteria and tuberculosis. On the more alternative side of the fence you have the arguments of ease of digestibility, health benefits, increased nutritional benefit and so on. Both sides have strong arguments... so it is really a very personal decision. In California raw milk is legalised and heavily regulated while in at least eight other states you're allowed to buy it from your local farmer. In Australia, all milk sold for human consumption has to be pasteurised by law, but there are some 'underground' dairies selling raw milk directly to consumers 'for animal consumption' and it is widely available (albeit extremely expensive) as Cleopatra's Bath Milk.

Pasteurisation is the process of heating milk for a short time and then immediately cooling it. It is designed to kill bacteria and extend shelf-life; and is extremely effective at doing so – killing 99.999% of both good and bad bacteria. During normal pasteurisation, milk is forced between metal plates and heated to 72°C for 15 seconds. To make UHT (or ultra-heat treating) milk they hold the milk at 138°C for at least two seconds.

Some scientists believe pasteurisation and ultra-pasteurisation flattens the complex three-dimensional protein molecules found within milk, making them much more difficult to digest and more inclined to produce an allergic immune response when absorbed through the gut (14). Scientists in Australia, Datta and Deeth, have looked into how UHT processing and subsequent storage causes changes affecting the shelf life of the milk. The changes include: whey protein denaturation, protein-protein interaction, lactose-protein interaction, isomerisation of lactose, Maillard browning which imparts a burnt flavor (and increases oxidative damage and free radicals), sulphydryl compound formation, formation of a range of carbonyl and other flavor-imparting compounds, and formation of insoluble substances (14). Pasteurisation has also been shown to significantly increase the oxidative damage on the fats in milk, compared to those in fresh, raw milk (13).

Unlike homogenization, pasteurization definitely has a purpose. It has been (and still is) pretty critical in maintaining the availability and sanitation of milk in an industrialised, urbanised world! But it may also make milk more difficult to digest.

#### *Organic vs NonOrganic*

Certified organic milk is produced without the use of pesticides, herbicides, hormones or antibiotics. In countries where cows aren't grass-fed, organic standards demand that they are grass fed for a certain number of days each year and are fed organic grain in between. I like to think this means the cows are generally happier, healthier and better looked after.

It also means the milk is better quality. Organic milk has also been found by the University of Newcastle, in England, to have 60% more antioxidants than conventional milk (7) and according to a recent study by the University of Aberdeen, has up to 71% more omega 3 fatty acids than non-organic milk (15). Given it is so widely available, I think organic milk is an obvious choice. If you can get organic biodynamic milk (like Paris Creek milk from South Australia), so much the better.

The moral of the story is... if you want to choose milk that is easier to digest, buy whole/full-cream organic/biodynamic unhomogenised milk that is permeate free. If you can easily access good quality, local, inexpensive raw milk from well-looked after cows, can meet the farmer and are satisfied with the hygiene of the dairy, then that is pretty great too! (If you're still slightly unsure, just boil the milk before you use it).

#### **The Ayurvedic perspective**

As always when researching these topics, I start to feel somewhat overwhelmed and confused with the big debates. It is inevitably a huge relief to get to the Ayurvedic perspective on things because it is very clear. The view is flexible because whether a food is good for you or not depends very much on individual circumstance... but it is always clear.

It is impossible to generalise when it comes to Ayurveda. I can't group 'dairy foods' together because every one has different qualities and different effects on the body. The only thing they have in common is they are all considered heavy and difficult to digest (except for ghee). Some are recommended for some people while others are not recommended for anyone or at least need to be prepared in special ways for their medicinal benefits to be experienced. Generally people with Kapha in their constitution or Kapha imbalances should avoid dairy foods, particularly in Winter (a kapha-aggravating time of the year). But that is the end of generalisations. Now to specifics....

MILK is highly revered because it nourishes the deep tissues of the body (particularly sexual reproductive tissue), is nourishing to the immune system (Ojas) and promotes a peaceful mind (Sattva). It is sweet and cooling so decreases Vata and Pitta and increases Kapha. Ayurveda recommends using full cream unprocessed milk but to make it lighter, warmer and easier to digest, it should be mixed half and half with water, brought to the boil and cooked with digestion-promoting spices such as cardamom, cinnamon, ginger, cloves etc.

BUTTER is also heavy, difficult to digest, sour and heating. It is advised that butter be clarified into ghee which is sweet, light cooling and enkindles the digestive fire. Ghee should be used in place of butter (in cooking and as a spread) as it is suitable for all constitutions.

CHEESE is considered sour, heavy, difficult to digest and congesting to the channels, particular harder, aged, yellow cheeses. White, young cheeses such as ricotta, fetta or panir are favoured but should always be consumed with digestive antidotes such as black pepper to help negate their mucous-forming effects. Hard cheeses decrease Vata but increase Pitta and Kapha while soft cheeses decrease Vata and Pitta and only aggravate Kapha.

YOGHURT is slightly warming and has a sour taste so tends to decrease Vata but increase Pitta and Kapha. Like cheese, it also has a congesting effect on the channels so is best eaten as a buttermilk curry or a light lassie (combined with water, spices and blended until fluffy). It is also advised to not eat curds in the evening, only ever at lunchtime.

CREAM & ICECREAM are very heavy and difficult to digest and are not recommended for any constitution. Icecream should particularly be avoided because it is so cold and therefore directly imbalances the digestive fire.

All dairy products should only be consumed with certain foods – including grains, spices and dried fruits (like in a porridge). According to Ayurveda they should specifically never be combined with fresh fruit or fish. This constant combining of dairy foods with fresh fruit in the Western world is perhaps another major contributor to why people find it so difficult to digest.

So what does Ayurveda think about dairy or lactose intolerance? An inability to digest milk and dairy foods (particularly if someone is from European descent or their ancestors have always consumed milk) is seen as a sign of compromised digestion – of either a dull or irregular digestive fire (Agni). If this is the case, it is usually recommended to remove all dairy foods

(apart from ghee) from the diet until the digestive fire can be restored through dietary and lifestyle recommendations, herbal preparations and treatments, if necessary. If an individual has the type of constitution that would benefit from the consumption of milk, it is usually the aim of the practitioner to work towards introducing it again. When it is reintroduced it is done so in a slow, steady and specific way – in small, daily doses and always prepared warm with spices.

From an Ayurvedic perspective, digestion can be compromised or put out of balance by many things but particularly by: stress, excessive thinking, a lack of routine, excess travel, excess stimulants (coffee, chilli, entertainment, technology) and eating too much stale, heavy and processed food. That list is a basically a summary of how most Westerners, and their children, now live their lives so from an Ayurvedic perspective it is no surprise whatsoever why more and more people are less able to digest dairy foods.

There is one more question you're bound to have – what about milk substitutes? Well, from an Ayurvedic perspective, almond and oat milk are usually preferred over soy and rice milk. Rice milk is incredibly sweet, soy milk is very astringent, drying and heavy while almond and oat are a little more balancing. However, all of these 'milk-substitutes' are usually highly processed so aren't ideal, unless you make them yourself! Another alternative to cow's milk is goat's milk which is considered much lighter and easier to digest. If you can get it relatively fresh, it tastes virtually the same too!

### Conclusion

The best thing about dairy-free diets is you automatically avoid all commercially produced and highly processed milk, cheese, yoghurt, cream and icecream. You also avoid all bad food combinations. This is a big plus. But you don't have to give up dairy to avoid these relatively toxic foods and combinations. All you have to do is become a more discerning consumer and a vaguely well informed cook. The worst thing about dairy-free diets is you don't get to enjoy the heavenly yumminess of warm

milk and ghee! Another obvious concern is calcium... so you just have to make sure you get bioavailable calcium from other sources which is totally do-able.

For some people, giving up dairy is a great idea while other folk can benefit enormously from its deeply nourishing, soothing and calming qualities. I'm one of those people who does really well on milk so I'm a big fan but my hubby doesn't have it so much because he has a genetic tendency to suffer from sinus congestion. So the upshot is, everyone is different. But... even if you give up all other dairy, Ayurveda would still recommend eating ghee.

I don't know about you but all this talk about milk is making me thirsty! I'm off to have a chai...

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